WHAT IS CLAIMED IS:

1. Method for operating a magnetohydrodynamic pump (5) for a liquid-metal anode (1) of an X-ray source, wherein it is operated in at least two modes,
wherein the first mode is a thawing mode in which the liquid metal (2) is melted in a line (3) of the liquid-metal anode (1),
the second mode is an operating mode in which the liquid metal (2) is pumped through the line (3) and X-ray beams are produced,
characterized in that
in thawing mode, the engine of the pump (5) is constantly switched on and off in turn.

2. Method according to claim 1, characterized in that, in the thawing mode, a sensor records whether the liquid state of the liquid metal (2) has been reached.

3. Method according to one of the previous claims, characterized in that there is a third, start-up mode between thawing mode and operating mode, in which the rotation speed of the pump (5) is increased.

4. Method according to claim 3, characterized in that the rotation speed of the pump (5) is increased until the liquid metal (2) displays its normal flow rate.

5. Method according to one of the previous claims, characterized in that, after the operating mode, there is a fourth, run-down mode in which the rotation speed of the pump (5) is reduced stepwise after X-ray beams have been produced.

6. Method according to claim 5, characterized in that the stepwise reduction of the rotation speed of the pump (5) does not take place until the temperature of the region of focus (4) falls below a predeterminable threshold value.

7. Method according to claim 6, characterized in that the threshold value is 50°C above the melting point of the liquid metal (2).

8. Liquid-metal anode (1) for an X-ray source with a liquid metal (2) which is located in a line (3),

wherein an anode module (15) is inserted into the line (3) in the region of focus (4),
with a pump (5) for circulating the liquid metal (2) in the line (3)
and with a cooling system (6) for the liquid metal (2),
characterized in that
an electron window (8) is inserted into the anode module (15)
and the pump (5) can be operated as a magnetohydrodynamic pump (5) by a method according to one of the previous claims.

9. Liquid-metal anode (1) according to claim 8, characterized in that a Bi alloy, in particular BiPb or BiPbInSn, is used as liquid metal (2).

10. Liquid-metal anode (1) according to claim 9, characterized in that the percentage by weight of Bi in the BiPb alloy is between 50 and 60 wt.%, in particular 55.5 wt.%, and the remainder is Pb.

11. Liquid-metal anode (1) according to claim 9, characterized in that the BiPb alloy contains 49.4 wt.% Bi, 18.8 wt.% Pb, 21.0 wt.% In and 11.6 wt.% Sn.

12. Liquid-metal anode (1) according to one of claims 8 to 11, characterized in that the line (3) is made of molybdenum.

13. Liquid-metal anode (1) according to one of claims 8 to 12, characterized in that the anode module (15) is made completely of molybdenum into which an electron window (8) is inserted which consists of light-permeable cubic boron nitride.

14. Liquid-metal anode (1) according to one of claims 8 to 13, characterized in that the electron window (8) is 10 - 80µm, in particular 40µm, thick.

15. Liquid-metal anode (1) according to one of claims 8 to 14, characterized in that the cooling system (6) is a minichannel cross-flow heat exchanger.

16. X-radiator with a cathode (9) for the emission of an electron beam (10)
and a liquid-metal anode (1) according to one of claims 8 to 15 emitting X-ray beams when the electron beam (10) strikes.